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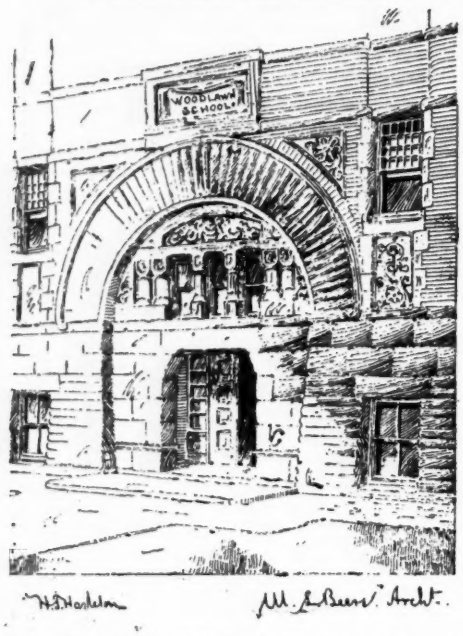
THE situation in Chicago remains much the same as upon the date of our last issue, as far as the action of the contractors is concerned. The code of principles were laid down as a line of action; all interested in the building progress of the city have indorsed them, and no work has progressed except according to their provisions. There is no disposition manifested in any department to depart from this line of action. They have been reaffirmed in some instances, and added strength has been received by their indorsement by the political committee of one of the leading clubs composed of business men. On the other hand, the unions have materially weakened in the false position assumed, and so long occupied by them. The bricklayers' union has gradually disintegrated, until contractors are able to secure almost all the labor in this department they require for the completion of contracts left in their hands. The carpenters have found that there is a large surplus unemployed in their trade who are ready and anxious to go to work, independent of any union. They attempted some resistance when the nine-hour rule of the association went into effect June 13, but the firm stand that is always taken by this, the most united association among the building trades of Chicago, averted the slightest approach to trouble. The effect is, that within the coming two weeks the masons' union will be powerless, and their interference gone. The rule of other unions will not deter the general resumption of work. In looking forward to this we feel that the journeymen will owe a large amount of gratitude to those who have so persistently fought for their emancipation from union rule, and in the triumph of personal freedom against brute force.

THE latest important moves made by the Master Masons' Association and the bricklayers' union is the formation of a new union of journeymen, at the instigation of the master masons, upon broad and sound principles, followed by the repeal of the demand for a Saturday pay day by the union. This, it will be claimed by the union leaders, should settle the controversy, but the attempt to place the difficulty in a false light will not succeed, as the general public are too well informed upon the real issue to be deceived. No bricklayer will be engaged to work until he personally assents to the principles enunciated, and no union will be treated with, or receive consideration, while the articles of its constitution and by-laws contain any provision or rule antagonistic to those principles. The strength of the entire movement against the arbitrary action by men or union seeking to abridge personal freedom is in the broad and just character of the principles, and this line of right, so well established and adhered to, must be maintained, and when union opposition ceases, not infringed upon.

THE National Association of Master Plumbers of the United States held the fifth annual convention in Chicago June 21, 22 and 23. The principal subjects discussed were the apprenticeship question, trade schools, and the attitude which associations should sustain in regard to manufacturers of plumbing goods. These questions we will discuss, and also give a general report of the proceedings in our July issue. The officers elected were: President, John Byrns, of New York; recording secretary, H. G. Gabay, of New York; first vice-president, John Trainor, of Baltimore; treasurer, M. J. Lyons, of Brooklyn; corresponding secretary, Walter T. Hudson, of Brooklyn; financial secretary, Enoch Remick, of Philadelphia. The delegates were 173 in number, representing 21 states and abont 40 cities, and represented a constituency of 1,359 master plumbers. The convention adjourned to meet next year at Boston, Mass.

Illinois State Association of Architects.



AT the regular meeting of the association, June 4, President Adler occupied the chair. Among the visitors was the Reverend Warren Randolph, of Newport, R. I., brother of Architect S. M. Randolph.

After transacting other business, the symposium appointed for this meeting was taken up, the subject being, "What are some of the Architectural Possibilities of such Materials as Paper, Glass, etc.?" Architect D. H. Burnham led the discussion.

D. H. BURNHAM.

When the model cheap house shall be finally evolved it is probable that paper will enter largely into its construction. We use the material already for outside weathering and for insulation. It has become standard wall decoration in the house; it often keeps out the cold of winter and the heat of summer; in floors, it cuts off the passage of sound, and no material better serves for ice-room walls. These uses are a beginning, but they are little more than suggestions of what will follow.

If fastest passenger trains thunder across the continent on paper wheels, exposed to storms, winds and changes of temperature, why may not the same material easily lend itself to statical conditions of our houses? While already used for siding, it seems not to have been thought of for shingles, floorings, architraves, and many kinds of constructive ornament; yet no other composition has been found which, in reality, can so fully meet the needs of a poor cottager, who, though empty of pocket, may yet be sensitive to color and form as any idle Midas. It will stand the climate under even the severest tests, and will scarcely need painting more than pine, though, like that noble material and friend of man, when one chooses it can be decorated to the designer's fancy. It can be molded, stamped, cut, nailed and handled more easily than anything we now have.

As in exterior use, so within; each part may be paper; and sometimes the walls and ceilings, plain or ornamented in relief, the bases, the architraves, the mantels, even the doors themselves, will be made of paper.

A most attractive subject for a draftsman's competition this, namely, "A Workman's Cottage. Show how much of it one can make of paper. Detail the construction, that we may know how the parts are to be put together and be fastened in place. Remember that paper, like wood, may be treated with paints for ornament or preservation."

Surely, if they be needed, manufactories will soon spring up, equipped to fill this need, and it may not be much to hope that, in our time, we may be able, by means of paper, to more quickly and cheaply supply the common people with houses suitable to the wage-working class and those of scanty fortune.

Glass. The crushing weight for glass is more than for granite, and for either plain or polished work it can be more cheaply produced. Why, then, is it not used where we now employ both granite and marble? for it is obviously a good building material. Like terra-cotta, it always was the best for certain work; and like the latter, it has been neglected for centuries, until modern necessities now demand its liberal use.

Besides being used in windows, glass was otherwise employed in buildings many centuries ago. It was used in rich mosaics on walls and ceilings by many peoples and in many places. It was cast into ornamental plates, and so formed entire interior wall surfaces of houses, but nowhere has it been valued at its true worth for architectural treatment. But its great adaptability, and the surety of its being cheaply produced, must arrest attention ere long, and it is probably reserved for us here, in the birthplace of so much that is new in our art, also to create a glass style that shall be better adapted to some of our needs, and be more beautiful than any known before. Like paper, it will lend itself to quick cleanliness of construction, and, together with paper, it may help us to altogether dispense with plaster. We may live to see many a building built of glass from grade to roof-tree, the walls, the ornaments, the gutters, the ridges, the tiles, the chimneys—in short, the whole exteriors. Nor will its use stop here; for why may it not become the best of partitions, ceilings, stairs, balustrades, fireplaces and baths?

Not terra-cotta itself may be more cheaply or rapidly furnished; for the constant and long attention to the terra-cotta kilns will not be necessary for easily melted glass. Imagine the joy of that designer to whom will surely sometime come the laconic man of facts and figures, holding out a pamphlet announcing that he will furnish annealed glass of any size or quality, solid or hollow, plain or ornamented, opaque, translucent or transparent, dull or polished, and of any color, tint or mixture known to art or nature. Imagine a ruddy dwelling built of this, and seen under the rays of a setting sun, with its glowing walls, rich with the penetrating depth of jasper stone; with crests and turrets softly melting against the evening sky, so that one may well doubt where a crimson cloud leaves off and the roof-line of the house begins. A house not having cold stone surfaces, but like the quality of pigments just spread upon an artist's palette; a house whose entrance-way shall still be red browns on iridescent walls, polished ceilings and dull-tinted floors; whose rosy boudoir and opalescent morning room shall be pure, dreamy and liquid as the heart of a pearly shell lapped by the waves at evening.

S. M. RANDOLPH.

The development of paper and glass has done much toward making possible the construction of a perfect building for habitation in this climate, where artificial heat is required for comfort during several months of each year.

It is well-known to those who have camped out that little or no danger is experienced from currents of air while living in open tents; the same persons find a different state of things when they return to life in substantial buildings; here a continual war of the elements is waged, the heavy atmosphere of the outside rushing in at every crevice to force out the lighter air as it is warmed and rarefied; this action produces what are familiarly called drafts, so dreaded by persons of comparatively little vitality.

In ordinary brick dwellings it is easy to find the cold air rushing in through the apertures between masonry and woodwork on all sides of window and door frames, for no matter how carefully they may have been joined the joint will soon be opened; it is not, perhaps, so well known that a current of air can often be found passing through the masonry and between the floor joist sufficient to blow out the flame of a candle. To remedy these defects, pieces of joisting should be fitted and nailed in close against the brickwork, and before the furrings are put on the walls should be entirely covered or lined with heavy, inodorous, waterproof paper, passing it over on to the woodwork of the window and door frames and back on the lower side of the joists overhead; if paper be continued across the ceilings and across furring for lathing placed below it the room will be found almost air-tight, and ridges of smoke and dust will not form on the ceilings, for they are caused by the air passing through the plastering, which acts as a filter and resists the passage of these atoms.

A liberal use of glass is also necessary for construction of the model room in which to sustain life. Abundance of light should be admitted, and sunshine too, wherever it is possible; for winter use the glass should be two thicknesses, with air space between; a continual draft will be found otherwise; the air will be chilled against the single thickness of glass, and will consequently fall to and pass along the floor toward the point where it can displace lighter air.

Rooms may easily be constructed as described that shall be nearly air-tight, and as such they will be quite uninhabitable; such construction, however, will enable the skillful architect to absolutely control the supply of air which it will be his duty to provide in abundance, delivering it in such manner and at such temperature as shall best conserve the health and comfort of the occupants, while the impure air is in like manner continually removed.

Economically considered, the free use of paper for lining walls and the double thickness of glass in windows will, in a very short time, pay large dividends in the saving of fuel; I do not hesitate to claim for an eight-inch wall properly lined with paper a greater resistance to the cold of winter or the heat of summer than is usually obtained from a wall built sixteen inches thick in the old method.

The line of thought suggested by Mr. Burnham in the initial paper was no doubt what was intended by those who suggested the topic for this meeting; that is to say, the writers were expected to hint at possibilities from the development of these two articles for purposes other than those for which they are now in use. Mr. Burnham's poetical fancies may be realized sooner, perhaps, than we expect, for the restless spirit of the American "crank," who goes about inventing things to meet our necessities, will find it an easy matter to solve any problem whose factors are so clearly indicated.

Perhaps it might be better to consider the subject in the light of how to obtain the best and most serviceable materials for construction, rather than to aim for the "model cheap house." The best is always the cheapest, and we have all tried to use the best we could get. How often have we found our interior finishing in a few months showing bad joints where perfect ones were made. This cannot well be otherwise. In only rare instances do we provide moisture in proportion to the expansion of the atmosphere, and the poor woodwork is subjected to a kiln drying process that it cannot resist, for wood is of cellular formation, and though subjected to treatment until the last particle of moisture is expelled, and one would think the shrinking process was complete; yet if old and shrunken cells be dressed off and the interior ones come near the surface they will contract nearly as much as the outer ones did when they were on the outside. Paper, when manufactured into material suitable for car wheels, ought to be, and no doubt is free from this defect.

While several objections to the use of glass, as suggested by Mr. Burnham, have presented themselves to my mind whenever my fancy has led in that direction, there are some ideas that have haunted me often. Two years ago, with many others, I went up the banks of the Hudson to Riverside Park, there to leave the remains of our most renowned countryman, a man as unlike the heroes of other nations as one can possibly imagine, a man who fills a page in the history of the world which is absolutely unique. This man's life and his death, his character and his place of sepulcher are certainly peculiar, and as my mind has often reverted to the spot where he lies it has imagined a suitable monument to complete the picture. None has ever quite reached my ideas of perfection, but over and again the thought has returned—it should be of glass.

NORMAND S. PATTON.

In order to prophesy the future development of such a material as paper, it will be well for us to consider its special characteristics, and from these we may judge whether it has reached the highest development possible. We class a great variety of substances under the general name

of paper, but our main idea is a flexible sheet, made of vegetable or other fiber which has been reduced to a pulp and then spread out, pressed and dried.

Its most obvious qualities are:

1. Continuity of surface. It can be made in rolls of almost any width and length. It is flexible, or by gluing several layers together may be made stiff. It will stop the passage of air because there are no joints.

2. It has no grain like wood and will not split.

3. It is not affected by change of temperature, and hence has an advantage over sheet metal as roofing material.

4. Whereas, in its natural condition it is affected by moisture, it may be rendered waterproof by saturating with asphalt, or by a variety of other treatments.

5. It is non-resonant and well fitted to prevent the passage of sound.

6. It is a non-conductor of heat.

7. It can be made of incombustible material like asbestos, or rendered fire resisting by chemical treatment.

We can, therefore, produce large sheets, either flexible or stiff, that will not conduct sound, heat or cold, and that will prevent the passage of air, moisture and fire.

Paper pulp is now made of such a variety of substances, each with its special qualities, that it is reasonable to suppose that we have not yet reached by any means the limit of its usefulness as a building material.

By combining paper pulp with other substances, and solidifying the mass by pressure, we may produce a material that will replace wood for many purposes, and the ease with which it may be made into sheets of any width and thickness that will not warp nor swell or shrink from heat or cold or dampness indicates the superiority of this material.

Mr. Burnham thinks that paper may become the material of the poor man's cottage. I will not dispute his position, for there is nothing impossible in this problem. The commercial success of the paper cottage will depend upon the discovery of some very cheap material for the pulp, and also a cheap process for compacting the same and rendering it waterproof. I am not aware that any compound has yet been placed on the market that will fully meet these conditions.

But granting that paper may become the poor man's friend, may it not aspire also to receive the attention of the rich? Is it not quite as likely that it will prove superior to other materials for certain purposes, as that it will be cheaper?

In the line of Mr. Burnham's suggestions, paper wheels are used because they are better rather than cheaper, than iron. For the deafening of floors, I am reminded by the curling up of matched flooring, that wet mortar has its disadvantages when used for this purpose, and when we must finish buildings in a hurry may we not stop the passage of sound by paper, perhaps combined with mineral wool, without introducing moisture into a building already too damp? And here I am led to diverge from the main topic to suggest that there is an interesting field for experiment in the line of determining the cheapest and most effectual method of stopping the passage of sound through floors and partitions. As far as I am aware there have been no thorough experiments made in this field, and we could hardly put some of the money of this association to better use than in arranging a careful series of experiments on the resistance of various materials and combination of materials to the passage of sound. We try mortar and plaster, sand, ashes and concrete between joists and on top of them, paper and felt, mineral wool, air spaces, etc., but who can tell how to stop the most sound for the least money?

In the way of decoration, good wall paper is unquestionably superior to poor fresco painting, and is so much cheaper than a good quality of hand decoration that its use will not be confined to the homes of the poor. We may expect to see new styles of "relief," Lincrusta, "papier-maché," etc., made from various kinds of paper.

Glass.—It is hard to come down from among the clouds and "half translucent finials" of Mr. Burnham's glass house to a prosaic discussion of this topic. And if I am to cherish a hope of occupying at some time an "opalescent morning room" in such a fairy palace, I must be chary of any hard criticisms of this artistic dream. For is it not recorded that "people who live in glass houses must not throw stones."

This truth which comes to us from an unknown antiquity, indicates clearly that there is "nothing new under the sun," and that the glass house has been tried long ago and found wanting. It is probable that the owner strove to defend his finials from the "maddening crowd," while he persisted in continuing his favorite pastime of throwing stones. The result has proved that the throwing of stones is so dear to the heart of man that the glass house must go, and we be content to dwell in more substantial, though less artistic abodes.

Indeed the present tendency is in exactly the opposite direction from that suggested by Mr. Burnham, for we behold on every side massive castles of stone from which the owners may hurl the gravel of the roof at any unlucky art critic who ventures to pause in front.

And yet glass has its good points. It is a material that ought to please the ladies, for they need not ask the salesman if it will "wash," and its beauty may lead some inventive genius to overcome the difficulties that bar its more general use.

The chief failings of glass as a constructive material are its brittleness and its fracture by sudden changes of temperature. Such limited toughness as our common glass utensils possess is only secured by a careful annealing. We have heard of toughened glass, but still await its appearance.

The use of glass is certainly increasing, but as a constructive material it is limited almost entirely to the transmission of light. We are not as far advanced as the French in the application of glass to roofs and floors. In Paris a common form of roof to an entrance porch is a light framework of iron filled in with heavy glass, and galleries are formed in bank and office buildings with floors entirely of iron and glass.

It does not seem likely that we will see many new applications of this material, unless we have a great cheapening of its cost, or a modification of its qualities.

D. H. BURNHAM.

We all agree, then, that paper is likely to come into more general use, and be applied in many places where it has not been. We can build something after the following manner now: The frames of the house to be of wood, the siding to be of building paper laid to break joints and weather, the lower edges to be cut into scallops, waving lines, or other shapes to suit.

Around the openings the paper to fasten into rabbits and the joints to be made tight. The roof to be made much the same way, leaving the effect of tiles, shingles, or whatever the designer may choose. Gutters, exterior architraves, or other parts may be stamped or molded in papier-maché, some for ornaments and details around porches, bays, or to ornament exterior features.

The entire exterior may be either finished with spar varnish or other paint to make the same impervious to weather and to decorate at the same time.

The interior features, even the walls and ceilings of a house to be much the same as the outside, and decorated in much the same way. The floors thus may be made of stiff pasteboard where carpets are to be used, and it may even be possible to leave them bare if finished with some spar varnish or other preparation hard enough to preserve them from the ordinary wear and tear of the floors.

All the above may be done now, and probably at a saving over the usual methods. It would require careful and thoughtful investigation on someone's part, but probably there is no need of any new material or condition not already close at hand. It may not be possible to make the sash, doors, stairs and blinds of paper at present, although it would be easy to do so. The special machinery could be made for their manufacture, and should the rest of many houses be made of paper, undoubtedly manufacturers would soon supply the above-mentioned articles also.

Paper, therefore, is already practicable for all parts of a house, except the constructional details.

A house thus built can be erected quicker, cheaper, and in a more cleanly manner, and, moreover, fitter to live in on account of the absence of moisture. All these things are more advantageous, and should recommend the free use of paper at an early date.

But the decorators have already shown that there is more value than the mere constructional one, and that not only may some of the wall ornaments be made of paper, but all of them, and that by it alone of all materials now known and used, an artist can obtain rich low relief effects in arabesque or cognate details at a reasonable cost where he wishes to enrich an entire surface. There is this additional advantage, that the contractor, while he is finishing the frames of the house, can prepare his entire wall surface so that they may be brought to the house and fastened up in a small part only of the time usually occupied for the finishing of the interiors.

When paper comes into general use there will be no more shrinkage, there will be no more abuse of the architect for the bad work of mechanics in the way of imperfect joints, chipped and dented wood of inferior quality as compared with the specifications! There will be no more ugly nail holes or other usual wood annoyances. There will be no more patching or deafening or trouble arising from wet floors and walls, and thus most of the anxiety and annoyance of an architect's life will be eliminated.

Glass—I am struck with the expression used by Mr. Randolph about the "restless spirit of the American crank." It is a good one and conveys a fine shade of meaning. I have read somewhere what Tyndall said regarding the necessary mental equipment of a good scientific man. He laid much stress upon the value of a great imagination to a physical researcher; and, lately, the greatest of modern essayists, M. Taine, has all at once discovered that the three greatest Italians, Dante, Michael Angelo, and Napoleon Bonaparte, were first of all men having giant imaginations. So it seems that if one has both the power of imagination to an unusual degree, and also active practicability in his nature, he will at once rise above the level and will appear as a star shining high above men's heads. But since only few have both glowing generalizing minds, and at the same time practical tendencies in work-habit, it becomes of importance to society that we supplement each other, and most of us being dull, plodding fellows, seeing only what we are made to see, "the American crank" becomes a thing of greatest value. The "wonder-if" of the past is the prophet of today. Many things have been less creditable than that glass will come largely into use for construction as well as ornament.

Mr. Patton says he is not aware that glass has been annealed much, and this would seem to settle the question as to whether or not we shall ever build of it; in fact he says this knowledge of his, namely: that he is not aware of its being done, shows that the tendency is all the other way, and that more solidity of materials is constantly aimed at.

Annealing of glass, like the annealing of iron, adds the quality of toughness. If glass is ever made tough it will become better than any other material for walls because it can be made cheaper than any stone, and is already stronger. So much is this material already thought of by the anticipators of the future, that one of them who has been practical enough in life to make himself independently rich at forty, has actually gone into the matter with a view of spending large sums of money; so earnest has he been about it that he has covered his ideas with patents. I am sorry not to be able to reach him today that you may indeed listen to a glorious "American crank." He would build hospitals ranging longer from east to west and exposed mostly to the sunshine on the south. The walls to be of glass, opaque or not, on the north, but certainly transparent toward the eternal source of heat and light. He would keep out the cold, damp air when the surgeon required, but he would let in the glowing health of the sun's warm rays to mend up the failing tissues of the body and the despondent minds of the patients. Nor would he long permit the germs of disease to linger on the premises, for his impenetrable surfaces of floors, ceilings and walls would be all made of polished glass, from which every extraneous material could most easily be removed. The large sheets of this material would leave few and exceedingly fine joints in which the microbes of fever could lurk.

The rooms of the sick might be lighted at times as if the patient were out of doors, or, on the other hand, a system of curtains might be draped about the walls so as to totally exclude the light, or partially, according to the surgeon's orders.

The crank would build houses of glass also; he would so perfect methods that the contractor for the seaside house would no longer need his mortar boards and beds, his lime, cement and hair, but would ship to the locality a complete plant for manufacturing what glass he needed upon the very spot.

Annealed or not, the stuff is practicable to be used. It will require experience, and no doubt disappointment, before men know how glass should be made for this purpose, under different conditions and for different purposes. And, as in other materials, so in this, economies must be carefully studied, methods constantly improved till the bare facts we started with today are made to tell for the good of the people. These facts are as follows:

That glass can be made under favorable conditions cheaper per cubic foot than good building stone, because after buying stone you have to cut and ship it, while glass is finished ready to go into the walls when cast.

That glass can be built more quickly into place.

That all moisture of construction is cut off, thus making the quick finish and permanency of interior work more sure.

That for once and all the ultimate of cleanliness is obtained, which alone is of vast consequence to us.

That not only flat color surfaces, but actual depth and consequent richness can be obtained in decoration by this method as by no other.

Finally, that a house thus built will protect its occupant more thoroughly than any other from dust, dirt and permeation of gases, and thus from the seeds of disease and death.

After a general discussion by Messrs. Burnham, Randolph, Patton, Pierce and others, the meeting adjourned. It was announced that the Executive Committee had decided to omit the meetings in July and August and the next meeting would occur September 6.

Association Notes.

WESTERN ASSOCIATION OF ARCHITECTS.

The board of directors of the Western Association of Architects met at Cincinnati, June 18. There were present: Dankmar Adler, of Chicago, G. W. Rapp and Charles Crapsey, of Cincinnati, and G. M. Goodwin of St. Paul, Minn. The board received remonstrances from quite a number who had been dropped from the roll of membership for non-payment of dues, coupled with their failure to "pay up," was because of neglect. The directors decided to reinstate all such upon payment being made. Eleven new applications for membership were received and passed upon, their names to be reported to the next meeting of the association for action. In the case of several members, whom it had been decided to suspend because of following other pursuits than that of architecture, their remonstrances were attended in some instances with the assurance that contracting had been abandoned. All such cases were ordered to be investigated by members of the board, and where found exclusively engaged in the practice of architecture, to be reinstated.

Suggestions presented by President J. W. Root were received. One of these calls for the establishment of an exhibit of drawings, photographs, etc., of executed work at the next convention of the Western Association, and that an effort be made to include in the exhibit the works of those most eminent in the profession, so that it may serve as a record of contemporary work. The board appointed J. W. Root, Charles Crapsey and J. F. Alexander as a special committee for the carrying out of this enterprise, these to be aided by the standing committee of the association upon the collection of drawings. A further suggestion was made by Mr. Root, to the effect that a series of papers be prepared under the auspices of the board, all to be upon one subject, for instance, "The relation between architect and contractor." The consideration of this suggestion was postponed for further consideration by a meeting of the board, to be held in Chicago in July.

ARCHITECT S. S. BEMAN has been engaged to design the new depot for the Wisconsin Central Railroad Company. This will probably be the largest and most expensive depot yet erected in Chicago. It will be situated on the corner of Harrison street and Fifth avenue. On the Harrison street side, which will be 228 feet front, three large arches will span driveways into an immense inner court, which will front the car tracks. The waiting rooms, etc., will occupy the Fifth avenue side, which will have 300 feet frontage. A tower 250 feet high, near the corner, will be a feature of the depot and part of the main building will be nine stories in height. The sheds will be 675 feet long. The entire cost will be upward of $1,000,000.

DRAFTSMAN WANTED—Architect R. H. Hunt, 113 Elizabeth street, Chattanooga, Tennessee, offers a good position to a first-class draftsman, thoroughly competent in design and detail. The same request for good draftsmen comes from B. S. Tolan, Ft. Wayne, Indiana, and George Hancock, Fargo, D. T.

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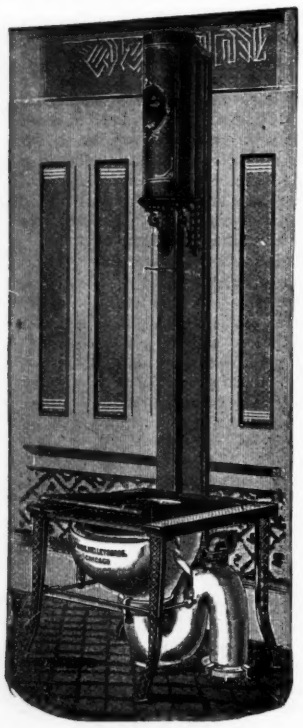

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